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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/702,574	11/07/2003	Kentaro Nakajima	245130US2S	8721

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EXAMINER

NHU, DAVID

ART UNIT PAPER NUMBER

2818

DATE MAILED: 12/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/702,574

Applicant(s)

NAKAJIMA ET AL.

Examiner

David Nhu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) 7-16 and 23-30 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 17 and 19 is/are rejected.
- 7) ☒ Claim(s) 18 and 20-22 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTIONS

Election/Restrictions

1. *Applicant's election of Group I (Claims 1-6, 17-22) is acknowledge.*

Claims 1-6, 17-22 are remained for examination. Claims 7-16, 23-30 are withdrawn from consideration as being directed to non-election invention. See 37 CFR 1.142 (b) and MPEP & 821.03.

Specifications

2. *Page 25, line 5, "wiring layer 28" should be --wiring layer 38--*

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

4. Claims 1 is rejected under 35 U.S.C. 102 (e) as being anticipated by Hosotani (6,829,162 B2).

Regarding claim 1, Hosotani, (see figures 6, 16, 17, col. 6, lines 36-50, col. 11, lines 60-67, col. 12, lines 1-46), teaches a magnetic memory device comprising: a substrate 11; and a wiring layer 13 formed on the substrate, wherein the wiring layer includes a lower electrode 55, a magneto-resistive element 31 formed on the lower electrode and configured to include an insulation barrier layer 32, at least one contact layer 16, 23 stacked on the magneto-resistive element, and an upper wiring 23 connected to the contact layer, and a taper angle of

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a side surface of the magneto-resistive element including the insulating barrier layer, relative to a bottom surface of the magneto-resistive element, is about 60 degrees or less (see figures 18, 20, col. 13, lines 7-21, col. 14, lines 7-32).

Regarding claims 2-6, (see col. 5, lines 42-67, col. 6, lines 1-29, figures 1-2, 6, 16-17)

Hosotani also teaches wherein the contact layer and the magneto-resistive element are formed in a self-alignment manner; a mask formed adjacent to the magneto-resistive element on the lower electrode (see figure 6); wherein the magneto-resistive element includes an insulative barrier layer 32 and at least two magnetic layers 31, 33 formed on both side of the insulative barrier layer, the insulative barrier layer and at least two magnetic layers having substantially equal etching rates with respect to an ion beam used for etching; a junction resistance.

Regarding claim 17, Hosotani, (see figures 6, 16, 17, col. 6, lines 36-50, col. 11, lines 60-67, col. 12, lines 1-46), teaches a magnetic memory device comprising: a substrate 11; and a wiring layer 13 formed on the substrate, wherein the wiring layer includes a lower electrode 55, a magneto-resistive element 31 formed on the lower electrode and configured to include an insulation barrier layer 32, at least one contact layer 16, 23 stacked on the magneto-resistive element, and an upper wiring 23 connected to the contact layer, and the magneto-resistive element has an inclined side surface which is cleaned by ion beam etching (IBE) after the magneto-resistive element is formed by IBE.

Regarding claims 19, Hosotani, (see figures 7, 16, 17, col. 6, lines 51-67, col. 7, lines 1-5, col. 11, lines 60-67, col. 12, lines 1-46), teaches a magnetic memory device comprising: a substrate 11; and a wiring layer 13 formed on the substrate, wherein the wiring layer includes

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a lower electrode 55, a magneto-resistive element 31 formed on the lower electrode and configured to include an insulation barrier layer 32, at least one contact layer 16, 23 stacked on the magneto-resistive element, and an upper wiring 23 connected to the contact layer, and an insulation film 20, which is provided to cover an entirety of the magneto-resistive element after the magneto-resistive element is formed by ion beam etching (see figures 6, 7), is formed of a material that is more easily oxidized than the lower electrode.

Allowable Subject Matter

5. Claims 18, 20-22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Kim'270, Asao'691, Abraham'718, Bronner'770, Nakajima'336 are cited as of interest.

7. A shortened statutory period for response to this action is set to expire 3 (three) months and 0 (zero) day from the date of this letter. Failure to respond within the period for response will cause the application to become abandoned (see 710.02 (b)).

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Nhu, (571)272-1792. The examiner can normally be reached on Monday-Friday from 7:30 AM to 5:00 PM. The examiner's supervisor, David Nelms can be reached on (571)272-1787.

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The fax phone number for the organization where this application or proceeding is assigned is (571)273-1792.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956

David Nhu

DN

A handwritten signature in black ink, appearing to read 'David Nhu', with a long horizontal stroke extending to the right.

December 8, 2004